

GCTTCCCGAGGCTCCGCACCAGCCGCGCTTCTGTCCGCCTGCAGGGCATTCCA  
GAAAGATGAGGATATTTGCTGTCTTTATATTCATGACCTACTGGCATTGCTG  
AACGCATTTACTGTCACGGTTCCCAAGGACCTATATGTGGTAGAGTATGGTA  
GCAATATGACAATTGAATGCAAATCCCAGTAGAAAAACAATTAGACCTGGC  
TGCACTAATTGTCTATTGGGAAATGGAGGATAAGAACATTATTCAATTTGTGC  
ATGGAGAGGAAGACCTGAAGGTTTCAGCATAGTAGCTACAGACAGAGGGCCC  
GGCTGTTGAAGGACCAGCTCTCCCTGGGAAATGCTGCACTTCAGATCACAGA  
TGTGAAATTGCAGGATGCAGGGGTGTACCGCTGCATGATCAGCTATGGTGCT  
GCCGACTACAAGCGAATTACTGTGAAAGTCAATGCCCCATACAACAAAATCA  
ACCAAAGAATTTTGGTTGTGGATCCAGTCACCTCTGAACATGAACTGACATGT  
CAGGCTGAGGGCTACCCCAAGGCCGAAGTCATCTGGACAAGCAGTGACCATC  
AAGTCCTGAGTGGAAGACCACCACCACCAATTCCAAGAGAGAGGAGAAGC  
TTTTCAATGTGACCAGCACACTGAGAATCAACACAACAATAATGAGATTTT  
CTACTGCACTTTTAGGAGATTAGATCCTGAGGAAAACCATACAGCTGAATTG  
GTCATCCCAGGTAATATTCTGAATGTGTCCATTAAAATATGTCTAACACTGTC  
CCCTAGCACCTAGCATGATGTCTGCCTATCATAGTCATTCAGTGATTGTTGAA  
TAAATGAATGAATGAATAACACTATGTTTACAAAATATATCCTAATTCCTCAC  
CTCCATTTCATCCAAACCATATTGTTACTTAATAAACATTCAGCAGATATTTAT  
GGAATAAAAAAAAAAAAAAAAAAAAAA

FIGURE 1

CGAGGCTCCGCACCCAGCCGCGCTTCTGTCCGCCTGCAGGGCATTCCAGAAAGA  
 TGAGGATATTTGCTGTCTTTATATTCATGACCTACTGGCATTGCTGAACGCATT  
 TACTGTCACGGTTCCCAAGGACCTATATGTGGTAGAGTATGGTAGCAATATGAC  
 AATTGAATGCAAATCCCAAGTAGAAAAACAATTAGACCTGGCTGCACTAATTGT  
 CTATTGGGAAATGGAGGATAAGAACATTATTCAATTTGTGCATGGAGAGGAAG  
 ACCTGAAGGTTTCAGCATAGTAGCTACAGACAGAGGGCCCGGCTGTTGAAGGAC  
 CAGCTCTCCCTGGGAAATGCTGCACTTCAGATCACAGATGTGAAATTGCAGGAT  
 GCAGGGGTGTACCGCTGCATGATCAGCTATGGTGGTGCCGACTACAAGCGAAT  
 TACTGTGAAAGTCAATGCCCCATACAACAAAATCAACCAAAGAATTTTGGTTGT  
 GGATCCAGTCACTCTGAACATGAACTGACATGTCAGGCTGAGGGCTACCCCA  
 AGGCCGAAGTCATCTGGACAAGCAGTGACCATCAAGTCCTGAGTGGTAAGACC  
 ACCACCACCAATTCCAAGAGAGAGGAGAAGCTTTTCAATGTGACCAGCACACT  
 GAGAATCAACACAACAATAATGAGATTTTCTACTGCACTTTTAGGAGATTAGA  
 TCCTGAGGAAAACCATACAGCTGAATTGGTTCATCCCAGAACTACCTCTGGCACA  
 TCCTCCAAATGAAAGGACTCACTTGGTAATTCTGGGAGCCATCTTATTATGCCTT  
 GGTGTAGCACTGACATTCATCTTCCGTTTAAGAAAAGGGAGAATGATGGATGT  
 GAAAAAATGTGGCATCCAAGATACAACTCAAAGAAGCAAAGTGATACACATFT  
 GGAGGAGACGTAATCCAGCATTGGAACCTTCTGATCTTCAAGCAGGGATTCTCA  
 ACCTGTGGTTTAGGGGTTTCATCGGGGCTGAGCGTGACAAGAGGAAGGAATGG  
 GCCCGTGGGATGCAGGCAATGTGGGACTTAAAAGGCCCAAGCACTGAAAATG  
 GAACCTGGCGAAAGCAGAGGAGGAGAATGAAGAAAGATGGAGTCAAACAGGG  
 AGCCTGGAGGGAGACCTTGATACTTTCAAATGCCTGAGGGGCTCATCGACGCC  
 TGTGACAGGGAGAAAGGATACTTCTGAACAAGGAGCCTCCAAGCAAATCATCC  
 ATTGCTCATCCTAGGAAGACGGGTTGAGAATCCCTAATTTGAGGGTCAGTTCTT  
 GCAGAAGTGCCCTTTGCCTCCACTCAATGCCTCAATTTGTTTTCTGCATGACTGA  
 GAGTCTCAGTGTGGAACGGGACAGTATTTATGTATGAGTTTTTCCTATTTATTT  
 TGAGTCTGTGAGGTCTTCTTGTGCATGTGAGTGTGGTTGTGAATGATTTCTTTGA  
 AGATATATTGTAGTAGATGTTACAATTTGTGCGCCAACTAACTTGCTGCTTAA  
 TGATTTGCTCACATCTAGTAAAACATGGAGTATTTGTAAAAAAAAAAAAAAAA

FIGURE 2

## 292 secreted (245 amino acids)

Signal/IgV/IgC/hydrophilic tail

(a) (b) (c) (d)

Ig cysteines in large bold

MRIFAVFIFMTYWHLLNA (signal)

FTVTVPKDLVVEYGSNMTIECKFPVEKQLDLAALIVYWEMEDKN  
IIQFVHGEECLKVQHSSYRQRARLLKQDQLSLGNAALQITDVKLQD  
AGVYRCMISYGGADYKRITVKVNAPY (IgV)

NKINQRILVDPVTSEHLETCQAEGYPKAEVIWTSSDHQVLSGKT  
TTNSKREEKLFNVTSTLRINTTTNEIFYCTFRRLDPEENHTAEL  
VIP (IgC)

GNILNVSIKICLTLPST (hydrophilic tail)

FIGURE 3

## 292 membrane (290 amino acids)

Signal/IgV/IgC/transmembrane (underlined)  
plus cytoplasmic

Ig cysteines in large bold

MRIFAVFIFMTYWHLLNA (signal)

FTVTVPKDLVVEYGSNMTIE**C**KFPVEKQLDLAALIVYWEMEDKN  
IIQFVHGEEDLKVQHSSYRQRRLLKDKDQLSLGNAALQITDVVKLQD  
AGVYR**C**MISYGGADYKRITVKVNAPY (IgV)

NKINQRILVDPVTSEHELT**C**QAEGYPKAEVIWTSSDHQVLSGKT  
TTNSKREEKLFNVTSTLRINTTTNEIFY**C**TFRRLDPEENHTAEL  
VIP (IgC)

ELPLAHPNERT**HLVILGAILLC**LGVALTFIFRLRKGRMMDVKKC  
GIQDTNSKKQSDTHLEET (transmembrane plus cytoplasmic)

FIGURE 4

AGATAGTTCCCAAACATGAGGATATTTGCTGGCATTATATTCACAGCCTGC  
 TGTCACCTTGCTACGGGCGTTTACTATCACGGCTCCAAAGGACTTGTACGTG  
 GTGGAGTATGGCAGCAACGTCACGATGGAGTGCAGATTCCCTGTAGAACG  
 GGAGCTGGACCTGCTTGCGTTAGTGGTGTACTGGGAAAAGGAAGATGAGC  
 AAGTGATTCAGTTTGTGGCAGGAGAGGAGGACCCTTAAGCCTCAGCACAGCA  
 ACTTCAGGGGGAGAGCCTCGCTGCCAAAGGACCAGCTTTTGAAGGGAAAT  
 GCTGCCCTTCAGATCACAGACGTCAAGCTGCAGGACGCAGGCGTTTACTGC  
 TGCATAATCAGCTACGGTGGTGCGGACTACAAGCGAATCACGCTGAAAGTC  
 AATGCCCCATACCGCAAAATCAACCAGAGAATTTCCGTGGATCCAGCCACTT  
 CTGAGCATGAACATAATATGTCAGGCCGAGGGTTATCCAGAAGCTGAGGTAA  
 TCTGGACAAACAGTGACCACCAACCCGTGAGTGGGAAGAGAAGTGTACCA  
 CTTCCCGGACAGAGGGGATGCTTCTCAATGTGACCAGCAGTCTGAGGGTCA  
 ACGCCACAGCGAATGATGTTTTCTACTGTACGTTTTGGAGATCACAGCCAG  
 GGCAAAACCACACAGCGGAGCTGATCATCCAGAACTGCCTGCAACACATC  
 CTCCACAGAACAGGACTCACTGGGTGCTTCTGGGATCCATCCTGTTGTTCC  
 TCATTGTAGTGTCCACGGTCCTCCTCTTCTTGAGAAAACAAGTGAGAATGCT  
 AGATGTGGAGAAATGTGGCGTTGAAGATACAAGCTCAAAAAACCGAAATGA  
 TACACAATTCGAGGAGACGTAAGCAGTGTTGAACCCTCTGATCGTCGATTG  
 GCAGCTTGTGGTCTGTGAAAGAAAGGGCCCATGGGACATGAGTCCAAAGAC  
 TCAAGATGGAACCTGAGGGAGAGAACCAAGAAAGTGTTGGGAGAGGAGCC  
 TGAACAACGGACATTTTTTCCAGGGAGACACTGCTAAGCAAGTTGCCCAT  
 CAGTCGTCTTGGGAAATGGATTGAGGGTTCCTGGCTTAGCAGCTGGTCCTT  
 GCACAGTGACCTTTTCTCTGCTCAGTGCCGGGATGAGAGATGGAGTCATG  
 AGTGTTGAAGAATAAGTGCCCTTCTATTTATTTTGAAGTCTGTGTGTTCTCACTT  
 TGGGCATGTAATTATGACTGGTGAATTCTGACGACATGATAGATCTTAAGAT  
 GTAGTCACCAAACCTCAACTGCTGCTTAGCATCCTCCGTAACCTACTGATACAA  
 GCAGGGAACACAGAGGTCACCTGCTTGGTTTGACAGGCTCTTGCTGTCTGA  
 CTCAAATAATCTTTATTTTTCAAGTCTCAAGGCTCTTCGATAGCAGTTGTTCT  
 GTATCAGCCTTATAGGTGTCAGGTATAGCACTCAACATCTCATCTCATTACA  
 ATAGCAACCCTCATCACCATAGCAACAGCTAACCTCTGTTATCCTCACTTCA  
 TAGCCAGGAAGCTGAGCGACTAAGTCACTTGCCACAGAGTATCAGCTCTC  
 AGATTTCTGTTCTTCAGCCACTGTCCTTTCAGGATAGAATTTGTCGTTAAGAA  
 ATTAATTTAAAACTGATTATTGAGTAGCATTGTATATCAATCACACATGCC  
 TTGTGCACTGTGCTGGCCTCTGAGCATAAAGATGTACGCCGGAGTACCGGT  
 CGGACATGTTTATGTGTGTTAAATACTCAGAGAAATGTTCAATTAACAAGGAG  
 CTTGCATTTTAGAGACACTGGAAAGTAACTCCAGTTCATTGTCTAGCATTAC  
 ATTTACCTCATTTGCTATCCTTGCCATACAGTCTCTTGTTCTCCATGAAGTG  
 CATGAATCTTGTTGAATAGTTCTTTTATTTTTTAAATGTTTCTATTTAAATGATA  
 TTGACATCTGAGGCGATAGCTCAGTTGGTAAAACCTTTCTCACAAGTGTG  
 AAACCTGAGTCTTATCCCTAGAACCCACATAAAAAACAGTTGCGTATGTTT  
 GTGCATGCTTTTGATCCCAGCACTAGGGAGGCAGAGGCAGGCAGATCCTG  
 AGCTCTCATTGACCACCCAGCCTAGCCTACATGGTTAGCTCCAGGCCTACA  
 GGAGCTGGCAGAGCCTGAAAAACGATGCCTAGACACACACACACACACA  
 CACACACACACACACACACACACACACCATGTACTCATAGACCTAAGTGCACC  
 CTCTACACATGCACACACATACAATTCAAACACAAATCAACAGGGAATTGT

Figure 5

CTCAGAATGGTCCCCAAGACAAAGAAGAAGAAAAACACCAAACCAGCTCTA  
TTCCCTCAGCCTATCCTCTCTACTCCTTCCTAGAAAGCAACTACTATTGTTTT  
GTATATAAATTTACCCAACGACAGTTAATATGTAGAATATATATTAAAGTGTC  
TGTC AATATATATTATCTCTTTCTTTCTTTCTTCCTTTCTTTCTTTCTTTCT  
TTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCT  
CTTCCTTCCTTCCTTTCTTTCTTTCTTTCTTTTTTTCTGTCTATCTGTACCTAAA  
TGGTTGCTCACTATGCATTTTCTGTGCTCTTCGCCCTTTTTATTTAATGTATG  
GATATTTATGCTGCTTCCAGAATGGATCTAAAGCTCTTTGTTTCTAGGTTTTCT  
TCCCCCATCCTTCTAGGCATCTCTCACACTGTCTAGGCCAGACACCATGTCT  
GCTGCCTGAATCTGTAGACACCATTTATAAAGCACGTACTCACCGAGTTTGT  
ATTTGGCTTGTTCTGTGTCTGATTAAAGGGAGACCATGAGTCCCCAGGGTA  
CACTGAGTTACCCAGTACCAAGGGGGAGCCTTGTTTGTGTCTCCATGGCA  
GAAGCAGGCCTGGAGCCATTTTGGTTTCTTCCTTGACTTCTCTCAAACACAG  
ACGCCTCACTTGCTCATTACAGGTTCTCCTTTGGGAATGTCAGCATTGCTCC  
TTGACTGCTGGCTGCCCTGGAAGGAGCCCATTAGCTCTGTGTGAGCCCTTG  
ACAGCTACTGCCTCTCCTTACCACAGGGGGCCTCTAAGATACTGTTACCTAGA  
GGTCTTGAGGATCTGTGTTCTCTGGGGGGAGGAAAGGAGGAGGAACCCAG  
AACTTTCTTACAGTTTTCTTGTTCTGTCAAGACTGAAGGAACAG  
GCTGGGCTACGTAGTGAGATCCTGTCTCAAAGGAAAGACGAGCATAGCCGA  
ACCCCCGGTGGAACCCCTCTGTTACCTGTTACACAAGCTTATTGATGAGT  
CTCATGTTAATGTCTTGTTGTATGAAGTTTAAGAAAATATCGGGTTGGGCAA  
CACATTCTATTTATTCATTTTATTTGAAATCTTAATGCCATCTCATGGTGTTGG  
ATTGGTGTGGCACTTTATTCCTTTGTGTTGTGTATAACCATAAATTTTATTTTG  
CATCAGATTGTCAATGTATTGCATTAATTTAATAAATATTTTATTTATTAATAA  
AAAAAAAAAAAAAAAA

Figure 5  
(continued)

MRIFAGIIFTACCHLLRAFTITAPKDLYWVEYGSNVTMECRFPVERELDLLALVYWEKEDEQVIQFVAGEE  
DLKPQHSNFRGRASLPKDQLLKGNAALQITDVKLQDAGVYCCIIISYGGADYKRITLKVNPYRKINQRISV  
DPATSEHELICQAEGYPEAEVIWTNSDHQPVSGKRSVTTSRTEGMLLNVTSSLRVNATANDVFYCTFWR  
SQPGQNHATAELIPELPATHPPQNRTHWLLGSILLFLIVSTVLLFLRKQVRMLDVEKCGVEDTSSKNRN  
DTQFEET.

Figure 6

Figure 6

mB74 vs. hB7-4

69% identity

mB7-4 1 MRIFAGIIFTACCHLLRAFTITAPKDLVVEYGSNVTMECRFPVERELDLLALVVYWEKE 60  
hB7-4 1 MRIFA IF HLL AFT+T PKDLVVEYGSN+T+EC+FPVE++LDL AL+VYWE E  
mB7-4 1 MRIFAVFIFMTYWHLLNAFTVTVPKDLVVEYGSNMTIECKFPVEKQDLAALIVYWE 60  
hB7-4 61 DEQVIQFVAGEEDLKQHSNFRGRASLPKDQLLKGNAAALQITDVKLQDAGVCCIISYGG 120  
D+ +IQFV GEEDLK QHS++R RA L KDQL GNAALQITDVKLQDAGVY C+ISYGG  
hB7-4 61 DKNIIQFVHGEEDLKQHSNFRGRARLLKDQLSLGNAALQITDVKLQDAGVRCMISYGG 120  
mB7-4 121 ADYKRITLVKNAPYRKINQRI-SVDPATSEHELICQAEGYPEAEVIWNSDHPVSGKRS 179  
ADYKRIT+KVNAPY KINQRI VDP TSEHEL CQAEGYP+AEVIWT+SDHQ +SGK +  
hB7-4 121 ADYKRITLVKNAPYRKINQRIILVDPVTSEHELTCQAEGYPKAEVIWNSDHPVSGKTT 180  
mB7-4 180 VTTSRTEGMLLVNTSSLRVNATANDVFYCTFWRSPQGNHTAELIPELPAHPPPQNRTH 239  
T S+ E L NVTSLR+N T N++FYCTF R P +NHTAEL+IPELP HPP RTH  
hB7-4 181 TTNSKREEKLFNVTSTLRINTTTTNEIFYCTFRRLDPEENHTAELVIPELPLAHPNERTH 240  
mB7-4 240 WVLLGSILLFLIVVSTVLLFLRKQVRMLDVEKCGVEDTSSKNRNDTQFEET 290  
V+LG+ILL L V T + LRK RM+DV+KCG++DT+SK ++DT EET  
hB7-4 241 LVILGAILLCIGVALTFIFRLRG-RMMDVKKCGIQDTNSKKQSDTHLEET 290

Figure 7



9/13

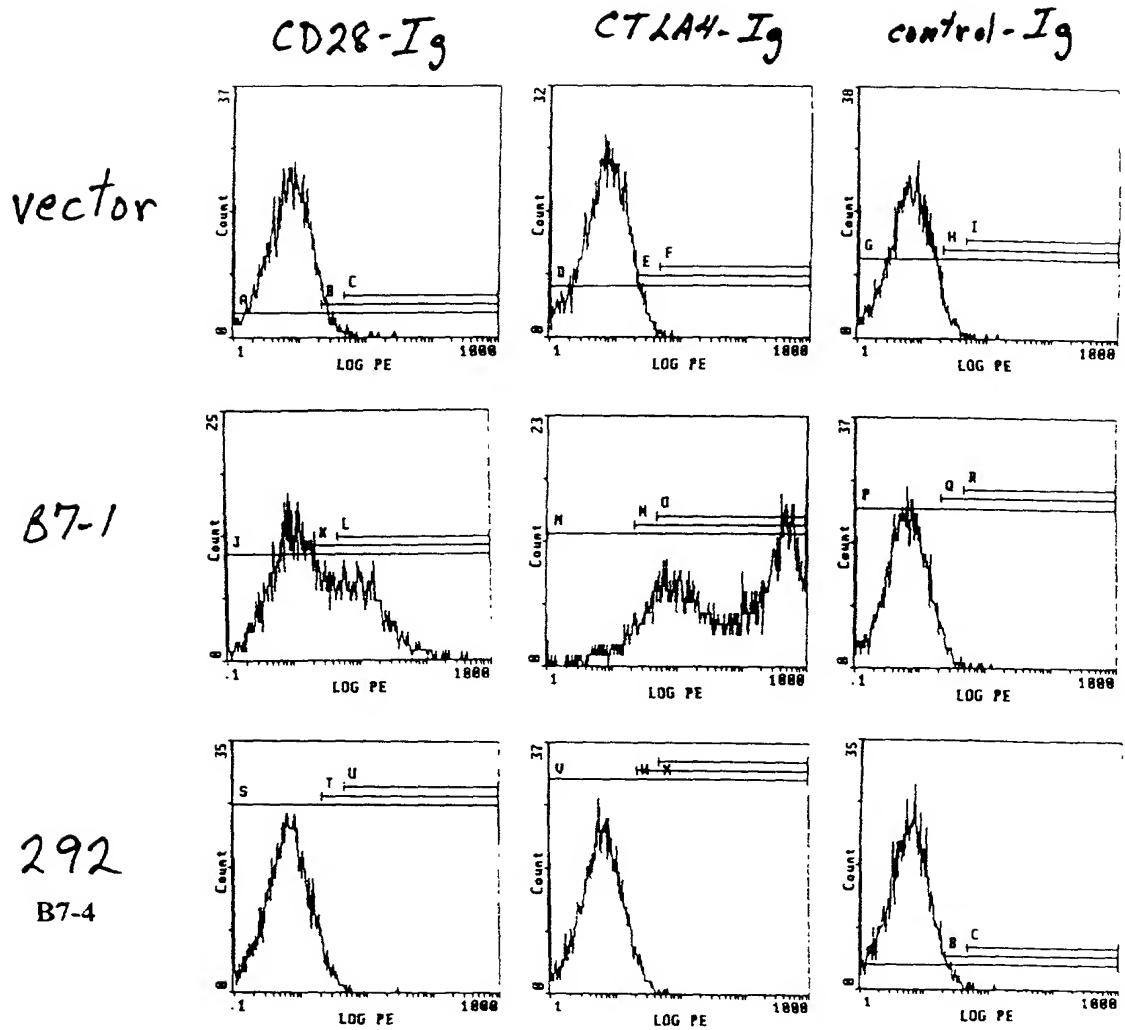
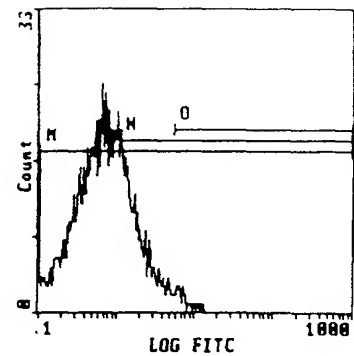
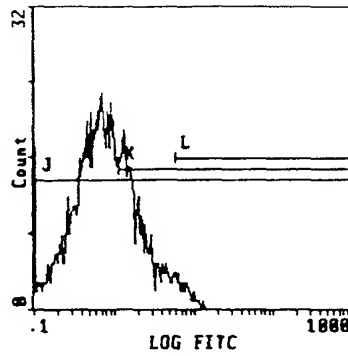


Figure 8

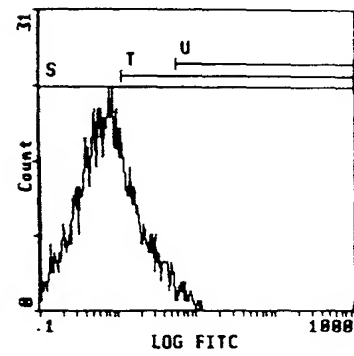
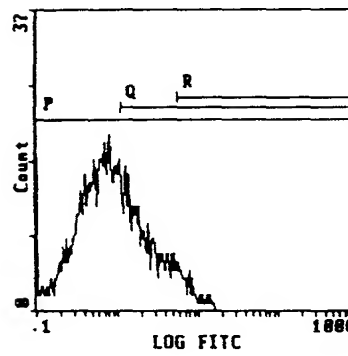
IgG

mICOS - Hs

vector



B7-1



292

B7-4

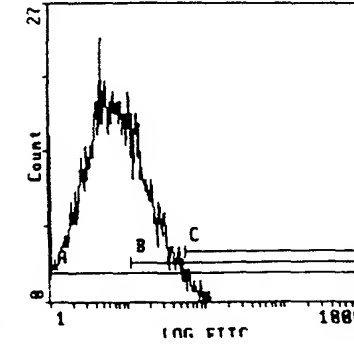
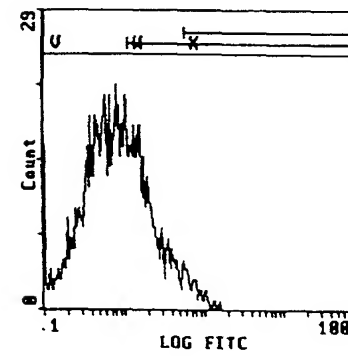


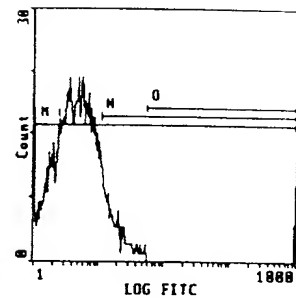
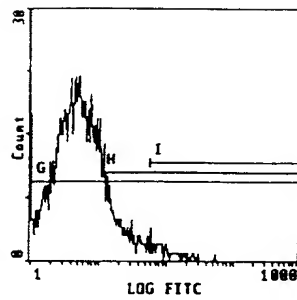
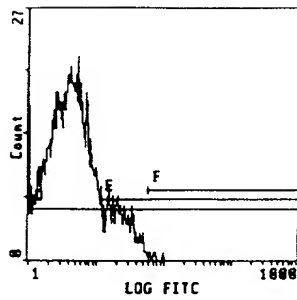
Figure 9

vector

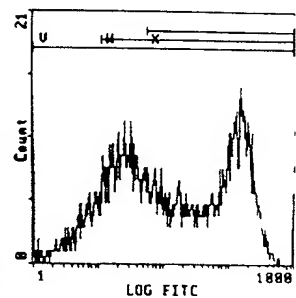
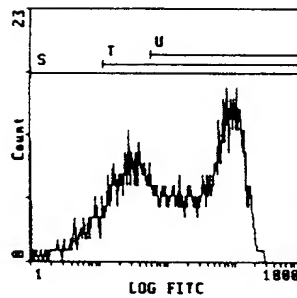
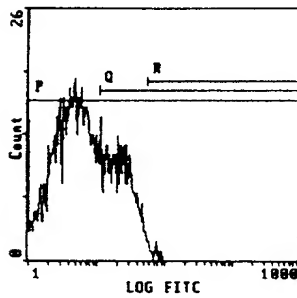
*IgM*

*BB1*

*133*



*B7-1*



*292*  
*B7-4*

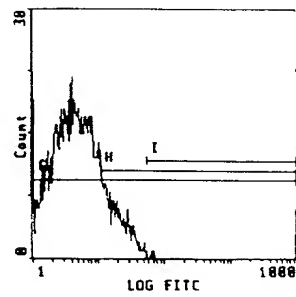
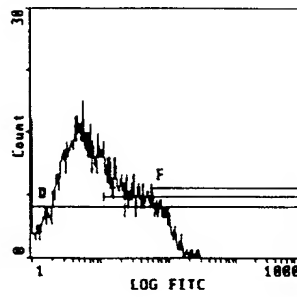
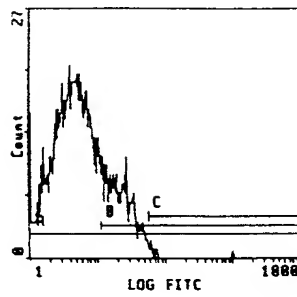


Figure 10

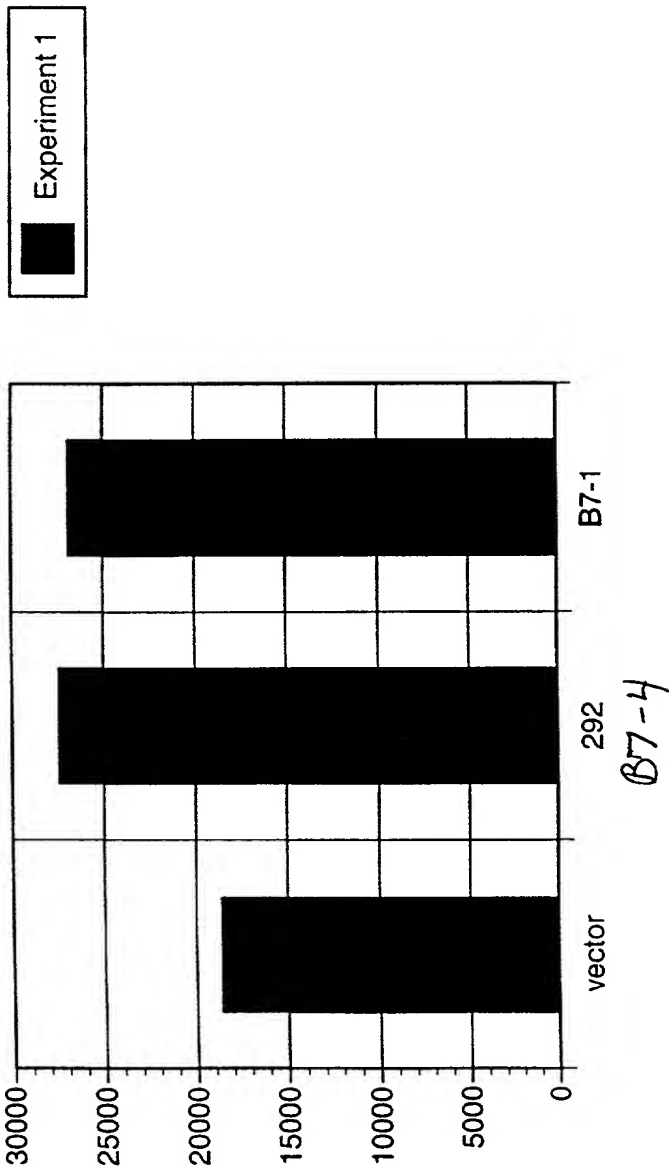


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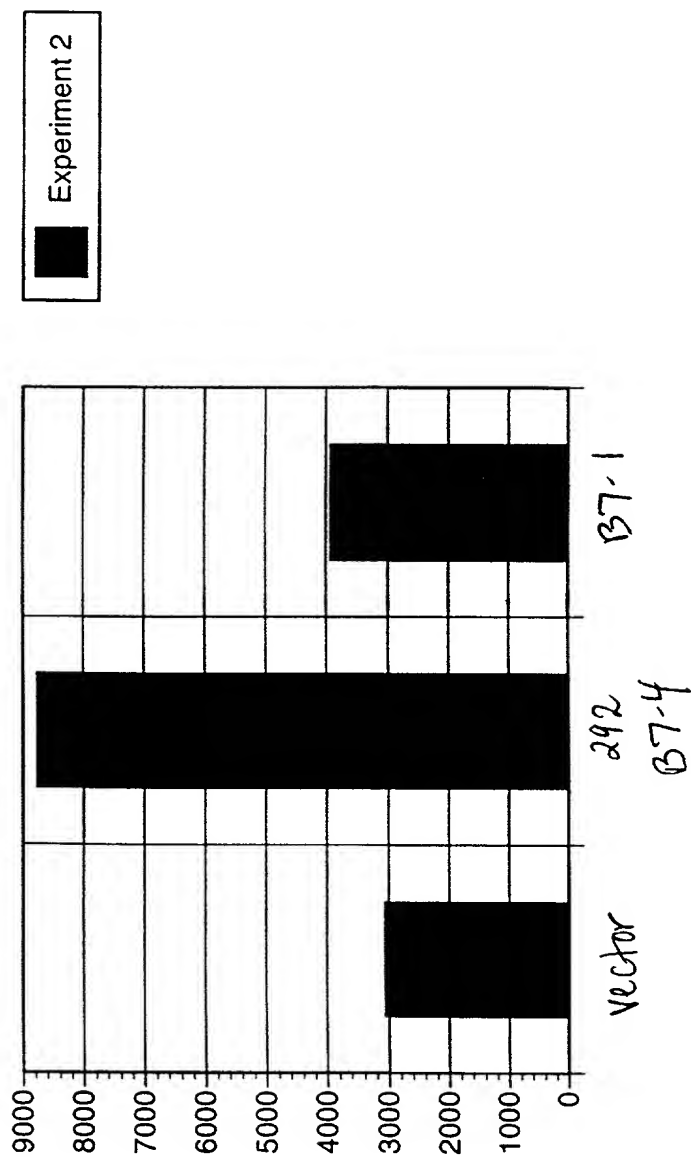


FIGURE 12